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BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, NW
SUITE 300
WASHINGTON, DC 20001-5303

EXAMINER	
WERNER, DAVID N	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,217	KAMIJO ET AL.	
	Examiner	**Art Unit**	
	David N. Werner	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-7,9-16,21,24-29 and 32-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-6,9-16,21,24-29,32-34 and 37-43* is/are rejected.

7)☒ Claim(s) *36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20050922*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is the First Action on the Merits for U.S. Patent Application 10/540,217, which is the National Stage Entry under 35 U.S.C. 371 of International Application PCT/JP03/16058, filed 15 December 2003, and claims priority to Japanese Patent Application 2002-371047, filed 20 December 2002. Currently, Claims 3, 7, 9–16, 21, 24–29, and 32–43 are pending.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 3, 9, 10, 13, 14, 24–29, and 38–41 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be performed on a particular machine or apparatus, or (2) must transform underlying subject matter (such as an article or

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 US 780, 787-88 (1876).

material) to a different state or thing. While the instant claims recite a series of steps or acts to be performed, the claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. The method claims do not give any limitations of a particular machine, nor can they be shown as transforming anything other than possibly digital picture data. Intangible data is not considered a physical "article" or "material" for patentablility.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

7. Claims 3, 7, 9–16, 21, and 38–41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0161399 A1 (Ali) in view of U.S. Patent 6,289,049 B1 (Kim et al.) and in view of U.S. Patent 7,367,042 B1 (Dakss et al.).

Although Independent Claims 9 and 11 are listed first, Claims 9 and 11 contain features that may be more fully addressed as appropriate in the discussion of Claims 13 and 14. Claims 9–12 are thus discussed after discussing claims 13–16 and 40.

8. Regarding Independent Claim 13, *Ali* teaches a system for segmenting a video image and then performing a quality measure for the region. *Ali*, abstract. Figure 2 and paragraph 0017 of *Ali* relate to the present invention. Motion vectors are estimated for pixel blocks in a standard motion estimation and motion compensation algorithm. *Id.* at 0017. This is the step of estimating a motion vector in step (a) of claim 13. Figures 2A–2C illustrate the motion of a circular object over a grid of pixel blocks, and figure 2D illustrates the motion vectors of the blocks corresponding with the circular object for the figure 2B frame. *Id.* A controller then segments each image based on the motion vectors. *Id.* A contiguous region of blocks of "similar" motion vectors makes up an object. *Id.* A pair of adjacent blocks with "disparate" motion vectors defines a boundary. *Id.* Then, the metric used to determine if motion vectors are similar or disparate is the claimed "correlation-related amount", and the step of comparing neighboring blocks to see if they have similar or disparate motion vectors in *Ali* is the claimed step of determining the correlation-related amount between the motion vector of

the current block and a motion vector of a surrounding block in step (b) of claim 13. The step of actually performing the motion compensation based on the estimated motion vector in *Ali* is step (c) of claim 13.

The present invention differs from *Ali* in two aspects. First, *Ali* does not give the exact value of the metric used to determine if motion vectors for adjacent blocks are similar or disparate, but the present invention specifies that the metric includes an absolute value of a difference of the motion vector for the current block and the motion vector of the surrounding block. Second, *Ali* does not disclose the identification codes of each block in a region, as claimed.

Kim discloses a motion vector prediction method in which multiple motion vectors for blocks surrounding the current block and the median value of these motion vectors are candidates for motion vector prediction. *Kim*, abstract. Regarding Claim 13, Figure 4 of *Kim* shows the flow chart for determining the motion vector prediction. *Kim* at column 4: line 36–column 5: line 41. First, the candidate motion vectors are searched as the motion vectors from three blocks surrounding the current block. *Id.* at 4:43–64. Next, the median value of the motion vectors is calculated, and compared with a maximum upper bound. *Id.* at 4:65–5:9. If the median prediction value lies under the bound, the median value is used. *Id.* at 5:1–5. Otherwise, more processing is required. *Id.* at 5:8–9. At step 408S, the absolute value of the difference between the median value and a prediction candidate is compared with a threshold. *Id.* at 5: 10–12. If the difference is above the threshold for each candidate, then the three motion vector candidates for the surrounding motion vectors are considered to be uncorrelated and

the smallest surrounding motion vector is used as the candidate predictor. *Id.* at 5:12–17. If the difference is below the threshold, then the motion vector candidates together are considered to be correlated and the median vector is used. *Id.* at 5:18–20. In other words, in *Kim*, the three surrounding motion vectors together are normally considered to be good candidates for predicting the motion vector for the current block. Then, the median may be used. If the three surrounding motion vectors are wildly different, they are all different from the median and so the median is an unreliable indicator of the motion vector for the current block. The absolute value of the difference of a candidate motion vector and the median motion vector is then considered a correlation metric to determine if the claimed estimated motion vector, that is, the median motion vector in *Kim*, is correlated with the motion vector of a block surrounding the block of interest, that is, an individual prediction candidate in *Kim*. Then, *Kim* discloses step (b) of claim 13, determining the correlation-related amount including an absolute value of a difference between motion vectors.

Ali discloses a majority of the claimed invention except for using an absolute value of a motion vector difference as a correlation metric. *Kim* teaches that this was a known method of determining if a motion vector predictor is reliable. Then, it would have been obvious to one having ordinary skill in the art at the time of the present invention to use the absolute value of a difference as the correlation metric to determine if blocks are similar or disparate in *Ali*, as taught by *Kim*, since *Kim* states in column 5: lines 42–49 that such a modification would help ensure that a very large motion vector value with a correspondingly large bit count is not used unless absolutely necessary.

Kim does not resolve the deficiency of *Ali* regarding the identification code. *Dakss* teaches a system for adding hyperlinked data to a broadcast video. *Dakss*, abstract. Regarding Claim 13, figure 5A illustrates coding needed to present the interactive video frame. *Id.* at column 5: lines 51–53. In the particular example, the image contains a shirt 205, hat 206, and shorts 207 as objects over a background. *Id.* at 10:49–52. These objects are segmented as different regions of the frame. *Id.* at 10:52–63. Each object, or region, is given a unique number. *Id.* at 10:61–62, 65–11:3. These numbers are stored as values of a region number field of a unique identifier (UID) field in a mask object associated with the image. *Id.* at 11:6–8, 25–37. These region numbers are the claimed ID codes.

Ali, in combination with *Kim*, discloses the claimed invention except for region ID codes. *Dakss* teaches that it was known to map each region of an image with a numbered unique identifier. Then, it would have been obvious to one having ordinary skill in the art at the time of the present invention to apply UIDs to the regions of *Ali*, as taught by *Dakss*, since *Dakss* states in column 11: lines 38–58 that such a modification would enable or facilitate user interactive functionality.

Regarding Claim 14, this claim describes using the average or mean of surrounding motion vector values as the basis of comparison with an estimated motion vector. *Kim* describes using the median of the surrounding motion vectors as the basis. *Kim* at column 5: lines 10–12. The use of a median value and a mean value is patentably distinct when it can be shown that the use of one value would lead away or

produce a substantially different result from the use of the other value. *In re Flint*, 32 C.C.P.A. 1116, 1122-23, 150 F.2d 126, 131, 66 U.S.P.Q. 121 (1945). However, in the present invention, this does not appear to be the case. Page 33 of the specification describes the use of the difference of average motion vector and an estimated motion vector. The specification particularly notes that if there is a large difference between the average value and an estimated motion vector, the reliability of the estimated vector is low, and the correlation is small. This is similar to the result in *Kim*, in which a large difference between an individual predictor motion vector and the median value indicated a low reliability of the median value and a disparity of the predictor values. Then, the use of the median value as in *Kim* and the use of the average value as in claim 14 are considered obvious variations, as they produce the same result. This rejection may be overcome with a showing that the use of the median would produce a substantially different correlation metric or lead away from the use of the average as claimed.

Regarding Claim 40, the example given in figure 4 of *Ali* illustrates a scenario with an object and a background, with the object having different motion than the background. *Ali*, paragraph 0017.

Regarding Independent Claim 15, in *Ali*, figure 1 illustrates controller 101 that performs the motion segmentation. *Ali*, paragraph 0015. This controller includes a memory or storage 106, which further includes frame or field buffer 107 that stores video information. *Id.* Memory 106 is the claimed "storage device". The controller also includes motion estimation unit 104 which performs the motion estimation, motion

compensation, and segmentation. *Id.* at paragraph 0017. Motion estimation unit 104 is the claimed "processor". The functionality of the estimator, when combined with the teachings of *Kim* and *Dakss* as described regarding Claim 13, is the claimed "program".

Regarding Claim 16, this claim describes using the average or mean of surrounding motion vector values as the basis of comparison with an estimated motion vector. *Kim* describes using the median of the surrounding motion vectors as the basis. *Kim* at column 5: lines 10–12. The use of a median value and the use of a mean value are patentably distinct when it can be shown that the use of one value would lead away from or produce a substantially different result from the use of the other value. *In re Flint*, 32 C.C.P.A. 1116, 150 F.2d 126, 66 U.S.P.Q. 121 (1945). However, in the present invention, this does not appear to be the case. Page 33 of the specification describes the use of the difference of average motion vector and an estimated motion vector. The specification particularly notes that if there is a large difference between the average value and an estimated motion vector, the reliability of the estimated vector is low, and the correlation is small. This is similar to the result in *Kim*, in which a large difference between an individual predictor motion vector and the median value indicated a low reliability of the median value and a disparity of the predictor values. Then, the use of the median value as in *Kim* and the use of the average value as in claim 16 are considered obvious variations, as they produce the same result. This rejection may be overcome with a showing that the use of the median would produce a substantially different correlation metric or lead away from the use of the average as claimed.

Regarding independent Claim 9, in *Kim*, the process of searching for the motion vector candidates as motion vectors of blocks adjacent to the current block, as illustrated in figure 2, is step (a). The process of classifying blocks into object regions in *Ali*, using the absolute difference value of motion vectors of *Kim* as the metric for determining similar or disparate motion vectors of *Ali*, is step (b). The process of using a median motion vector as the motion vector predictor in *Kim* when appropriate is considered an obvious variation of step (c), using the average of surrounding motion vectors. This may be overcome by a showing that the median of *Kim* would lead away from or produce a substantially different motion vector than the claimed average. *In re Flint*, 32 C.C.P.A. 1116, 150 F.2d 126, 66 U.S.P.Q. 121 (1945).

Regarding Claim 10, in *Kim*, the motion vector predictor candidates for a current block are the actual motion vectors of previous blocks. *Kim* at column 1: line 59. The motion vector for the current block, in turn, will be used as a motion vector predictor candidate for a future block, and so on, until every block in the frame has a motion vector predictor.

Regarding independent Claim 11, in *Ali*, as mentioned with respect to Claim 15 *supra*, memory or storage 106 is the claimed "storage device", and the motion estimation unit 104 is the claimed "processor". As mentioned with respect to Claim 9 *supra*, in *Kim*, the process of searching for the motion vector candidates as motion vectors of blocks adjacent to the current block, as illustrated in figure 2, is step (a). The process of classifying blocks into object regions in *Ali*, using the absolute difference

value of motion vectors of *Kim* as the metric for determining similar or disparate motion vectors of *Ali*, is step (b). The process of using a median motion vector as the motion vector predictor in *Kim* when appropriate is considered an obvious variation of step (c), using the average of surrounding motion vectors. This may be overcome by a showing that the median of *Kim* would lead away from or produce a substantially different motion vector than the claimed average. *In re Flint*, 32 C.C.P.A. 1116, 150 F.2d 126, 66 U.S.P.Q. 121 (1945).

Regarding Claim 12, in *Kim*, the motion vector predictor candidates for a current block are the actual motion vectors of previous blocks. *Kim* at column 1: line 59. The motion vector for the current block, in turn, will be used as a motion vector predictor candidate for a future block, and so on, until every block in the frame has a motion vector predictor.

Regarding Independent Claim 21, in *Ali*, as mentioned with respect to Claim 15 *supra*, memory or storage 106 is the claimed "storage device", and the motion estimation unit 104 is the claimed "processor". The step of performing block-based standard motion estimation in before performing segmentation in paragraph 0017 of *Ali* is step (b1). Particularly, let the picture in *Ali* figure 2A be the claimed picture at time t1 and the picture in *Ali* figure 2B be the claimed picture at time t2. Since in paragraph 0017 and figure 2 of *Ali* the motion estimation is performed before segmenting between the foreground and background, it is done "without discriminating between the background image and moving objects". As shown in the discussions of claims 9, 13,

and 14 *supra*, the combined teachings of the *Ali*, and *Kim* references disclose determining motion vectors using the methods of claims 9, 13, or 14, as required by step (b2). The process of assigning the identification code in step (b3) is based on the combined teachings of *Ali* and *Kim*, which disclose partitioning or segmenting an image into regions by determining if the absolute value of a difference between motion vectors of adjacent blocks is less than a predetermined value, and the teaching of *Dakss*, which discloses assigning identification codes to different regions of an image.

Regarding Independent Claim 38, figure 2 of *Ali* illustrates the claimed N consecutive pictures within a time-series of pictures. As discussed for example with respect to Claim 13 *supra*, the combined teachings of *Ali*, *Kim*, and *Dakss* disclose the claimed process of step (a) of assigning the same identification code to adjacent blocks as needed. In step (b), *Ali* discloses determining a boundary of an object as a point in which two adjacent blocks have disparate motion vectors. *Ali* at paragraph 0017. This is the claimed step of determining if objects having two different identification codes are in contact with each other. *Ali* also discloses determining that two adjacent blocks are in the same object if they have similar motion vectors. *Id.* This is the claimed step of determining that correlation within a first object is above a predetermined value. In step (c), *Dakss* describes a "flood-fill" algorithm that allows a user to highlight a specified region in interactive viewing. *Dakss* column 24: line 50–column 26: line 51. This process may be done two-dimensionally, in which every pixel in a region is given the highlight color. *Id.* at 24:50–56. There may also be a three-dimensional fill, in which the

pixels in a 3D "space-time" volume may also be filled, with the three dimensions being horizontal, vertical, and time. *Id.* at 24:56–25:17. In other words, a specified region is tracked throughout a plurality of frames. Figures 11A and 11B illustrate this process. At block N, every pixel in a region (r, c) is given a highlight color. *Id.* at 25:18–24. Using the tracking method, both the corresponding pixels in the same region at frame N+1 and frame N-1 may also be highlighted. *Id.* at 25:24–39. Then, the tracking of objects in *Dakss* may be backward, as required in element (c).

Regarding Claim 3, from figure 19 and page 40, it appears that the correlation is a measure of relative speed of overlapped objects. For example, as shown in figure 19, object 1 is moving faster than object 2, and so a greater amount of it is visible from beneath object 2 at time t than at time t-1. From this, it seems that the correlation function may be a function of relative magnitude of motion, or speed. However, in *Ali*, as shown in figure 2D, two regions having "disparate" motion vectors, the foreground and background, have different speeds, with the foreground moving relatively quickly to the background. Then, the claimed algorithm is considered to be encompassed within the process of determining disparate motion vectors in *Ali*.

Regarding Independent Claim 39, as mentioned with respect to Claim 15 *supra*, *Ali* discloses the claimed "storage device" and "processor". As mentioned with respect to Claim 38 *supra*, the combined teachings of *Ali*, *Kim*, and *Dakss*, disclose step (a), *Ali* discloses step (b), and *Dakss* discloses step (c).

Regarding Claim 7, from figure 19 and page 40, it appears that the correlation is a measure of relative speed of overlapped objects. For example, as shown in figure 19, object 1 is moving faster than object 2, and so a greater amount of it is visible from beneath object 2 at time t than at time t-1. From this, it seems that the correlation function may be a function of relative magnitude of motion, or speed. However, in *Ali*, as shown in figure 2D, two regions having "disparate" motion vectors, the foreground and background, have different speeds, with the foreground moving relatively quickly to the background. Then, the claimed algorithm is considered to be encompassed within the process of determining disparate motion vectors in *Ali*.

Regarding Claim 41, figure 2 of *Ali* illustrates an image divided into blocks, as required by step (a). The blocks may be size 4 x 4 pixels or any arbitrary size. *Ali* at paragraph 0017. The step of performing block-based standard motion estimation in before performing segmentation in paragraph 0017 of *Ali* is step (b1). Particularly, let the picture in *Ali* figure 2A be the claimed picture at time t1 and the picture in *Ali* figure 2B be the claimed picture at time t2. Since in paragraph 0017 and figure 2 of *Ali* the motion estimation is performed before segmenting between the foreground and background, it is done "without discriminating between the background image and moving objects". As shown in the discussions of claims 13 and 14 *supra*, the combined teachings of the *Ali*, and *Kim* references disclose determining motion vectors using the methods of claims 13 or 14, as required by step (b2). The process of assigning the identification code in step (b3) is based on the combined teachings of *Ali* and *Kim*,

which disclose partitioning or segmenting an image into regions by determining if the absolute value of a difference between motion vectors of adjacent blocks is less than a predetermined value, and the teaching of *Dakss*, which discloses assigning identification codes to different regions of an image.

9. Claims 24–27, 29, 32–35, 37, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ali* in view of *Kim* and *Dakss*, and further in view of U.S. Patent 6,243,495 B1 (*Naveen*). Regarding Independent Claim 42, *Dakss* discloses the claimed object map, as object mapping table 217 containing the UID values for the different regions. *Dakss* at column 11: lines 26–37. Then, the process of determining the similar motion vectors for the blocks within a region in paragraph 0017 of *Ali* is step (a). The forward and backward tracking of an object of interest in figure 11A and column 25: lines 19–38 of *Dakss* is the process of determining the region based on the motion vector and an object map as the region moves forward or backward in time in step (b). However, none of the cited references disclose the claimed step of using a weighted average of motion vectors with weight as a function of overlap.

Naveen teaches a method of segmenting or partitioning MPEG video. Regarding Claim 42, in *Naveen*, motion vectors are first obtained according to standard procedure. Next, the motion vectors are refined according to the weighted average of surrounding macroblocks, with the weight proportional to the overlap of the area of the surrounding motion-compensated macroblocks. *Naveen*, column 4: lines 43–47, column 6: lines 5–10. This is the claimed step of using a weighted motion vector average with the weight

corresponding to the areas of overlapping blocks and the region of interest, or current block.

Ali, in combination with *Kim* and *Dakss*, discloses the claimed invention except for the weighted motion vectors proportional to overlap area. *Naveen* discloses using this weighing. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to modify the system of *Ali* to use the "refined" motion vectors of *Naveen*, since *Naveen* states in column 2: lines 39–44 that such a modification would enable the use of more high quality motion coding, particularly for video that is recorded or encoded at real-time but does not need to be played back live.

Regarding Claim 24, in *Ali*, motion vector determination is done blockwise. *Ali* at paragraph 0017. Then, the "region of interest" of step (a) of the parent claim that is the basis of the motion vector corresponds to one block, as required in claim 24.

Regarding Claim 25, in *Dakss*, a new mask containing the region maps is generated for each frame. *Dakss*, column 10: lines 62–64. Then, *Dakss* generates a new map for each frame. The motion backwards from frame N to frame N-1 in figure 11A is the claimed movement in the negative direction of the motion vector.

Regarding Claim 26, in *Dakss*, since a new mask is generated for each frame, it must always update the oldest object maps with a newest object map, as claimed.

Regarding Claim 27, in *Ali*, a normal forward motion vector from the figure 2B frame at time t1 to the figure 2C frame at time 2 is the claimed "fast-forward motion vector". As previously mentioned, in the combined teachings of *Ali* and *Kim*, a pair of

adjacent motion vectors having an absolute value difference greater than a threshold is considered to be a pair of "disparate" motion vectors in different regions according to paragraph 0017 of *Ali*.

Regarding Claim 29, as discussed with respect to for example claim 9 *supra*, in *Ali* and *Kim*, the process of segmenting a picture into objects or regions based on the absolute value of difference of motion vectors is the claimed process of determining of the absolute value of the difference is more than a threshold value. Two adjacent frames are at time t1 and t2, with the "interval of time" as the temporal distance between the two adjacent frames.

Regarding Independent Claim 43, as mentioned with respect to Claim 15 *supra*, *Ali* discloses the claimed "storage device" and "processor". As mentioned with respect to Claim 42 *supra*, the combined teachings of *Ali* and *Dakss* disclose the process of steps (a) and (b) and *Naveen* discloses the claimed process of using the weighted motion vectors.

Regarding Claim 32, in *Ali*, motion vector determination is done blockwise. *Ali* at paragraph 0017. Then, the "region of interest" of step (a) of the parent claim that is the basis of the motion vector corresponds to one block, as required in claim 32.

Regarding Claim 33, in *Dakss*, a new mask containing the region maps is generated for each frame. *Dakss*, column 10: lines 62–64. Then, *Dakss* generates a new map for each frame. The motion backwards from frame N to frame N-1 in figure 11A is the claimed movement in the negative direction of the motion vector.

Regarding Claim 34, in *Dakss*, since a new mask is generated for each frame, it must always update the oldest object maps with a newest object map, as claimed.

Regarding Claim 35, in *Ali*, a normal forward motion vector from the figure 2B frame at time t1 to the figure 2C frame at time 2 is the claimed "fast-forward motion vector". As previously mentioned, in the combined teachings of *Ali* and *Kim*, a pair of adjacent motion vectors having an absolute value difference greater than a threshold is considered to be a pair of "disparate" motion vectors in different regions according to paragraph 0017 of *Ali*.

Regarding Claim 37, as discussed with respect to for example claim 9 *supra*, in *Ali* and *Kim*, the process of segmenting a picture into objects or regions based on the absolute value of difference of motion vectors is the claimed process of determining of the absolute value of the difference is more than a threshold value. Two adjacent frames are at time t1 and t2, with the "interval of time" as the temporal distance between the two adjacent frames.

Allowable Subject Matter

10. Claim 36 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: Claim 36 is directed to a novel and non-obvious process of segmenting images based on clustering histograms of motion vector speeds of blocks and detecting

different peaks in the histograms, the peaks corresponding with different regions, as illustrated in figure 26.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,594,310 B1 (Marques) teaches a partitioning system. U.S. Patent 6,307,885 B1 (Moon et al). teaches a blockwise clustering system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/D. N. W./
Examiner, Art Unit 2621

/Mehrdad Dastouri/
Supervisory Patent Examiner, Art Unit 2621